and twenty-three are found in the Mount Gambier formation. Of about thirty Cyclostomatous Bryozoa which occur in this deposit, at least seven are common to it and Orakei Bay. Besides the Bryozoa the author has obtained many other organisms from this clay, and especially a large number of Foraminifera, now in the hands of Prof. Karrer of Vienna. He estimates the total number of determinable species belonging to various classes at over 200.

In treating of his special subjects the author adopts the principles of classification laid down by Hincks, Smitt, and other recent writers on living Bryozoa, which he regards as preferable in themselves, and also as facilitating the comparison of fossil with recent forms.

BIBLIOGRAPHICAL NOTICE.

A Memoir on the Echinodermata of the Arctic Sea to the West of Greenland. By P. Martin Duncan, M.B. (Lond.), F.R.S., &c., and W. Percy Sladen, F.G.S., F.L.S., &c. With Six Plates. London: Van Voorst, 1881.

The value and importance of a carefully prepared monograph on a given group of a given zoological province was brought before the readers of this journal a month or two ago, when their attention was directed to Capt. Legge's work on the Birds of Ceylon. We have again to illustrate this point by a notice of the memoir on a very different group of animals and from a very different region, which Prof. Duncan and Mr. Sladen have been able, by the aid of the government-grant fund, to publish in a very handsome form.

Thirty species of Echinodermata are in all described, and careful figures of parts, or complete specimens of most of these, are to be found on the six large plates which make a not unimportant portion of the volume. All, we are informed, tell the same tale as to distribution, and speak to the existence of a circumpolar fauna; herein they corroborate the results to which all recent investigators into the details of Arctic distribution have been led, and which, we may point out, were, so long ago as 1861, well expressed by Sir Joseph Hooker, when he spoke of the Scandinavian flora as girdling the globe in the Arctic Circle. When, however, the authors add to this that there is no extension northwards from more temperate climates we cannot think that they mean to speak of an arctic circumpolar as distinguished from a boreal circumpolar region (in the sense in which these words are used by Prof. Ehlers); for of the species which they describe no less than nine* have been found further south than the sixtieth parallel, and seven others have been

* Or ten, if the *Ophioglypha Tenorii* of Heller (Adriatic) be, as Mr. Lyman thinks, synonymous with *O. robusta*.

found in our own seas. An arctic area in a zoogeographical sense must, as Marenzeller has pointed out, embrace all points which come in contact with the Polar stream.

While on the subject of distribution we cannot but draw attention to another example of the resemblance between the Arctic and Antarctic faunas. In his lately published 'Preliminary List' Mr. Lyman gives as one of the localities for a species described in this monograph (*Ophiocten sericeum*) the rarely visited Marion Island.

Of the species described one only (*Antedon prolixa*) is absolutely new; but of the rest, one Ophiurid and one Asterid were first described by the authors of the present memoir in the pages of this journal, and from the very material on which their present work is based; while the time which has elapsed since their earliest determinations were published have, in both cases, enabled them to reconsider the generic appellations of the new forms. But, though the new species are comparatively inconspicuous, it does not by any means follow that the specimens which the authors have had in their hands have not required or received especial and careful study. In the first place, forms which extend over wide areas must exhibit a not inconsiderable range of variation, and forms widely distributed must be continually subjected to more or less insufficient descriptions at the hands of naturalists incompletely equipped for the work. This will become evident to any reader who will examine into the length and substance of the synonymical lists which Messrs. Duncan and Sladen have found it necessary to put out; some of these are so long that they not unnaturally bring before the mind the question of how far we might or might not be justified in accepting *in toto* the bibliographical data of our predecessors. With the abundance of the opportunities which are now afforded to all zoologists to write as much and at what length they please, it is obvious that if lists are prepared of every collection which makes its way into a museum, and if each of the quotations in these lists is to find its way into a synonymic list, the natural historian of a very early future will drag a chain of very considerable length; and the only possible relief will have to be found in taking the work of his predecessors not at their worth, but at a very high value.

We have been led by these considerations to institute a close comparison between one of the lists given by Messrs. Duncan and Sladen and that given for the same species (*Strongylocentrotus drö-bachiensis*) by the naturalist whose fame is so largely associated with his work on the same group.

Far from finding that the one is the copy of the other, or that the work which the later writers have undertaken has been one of supererogation, we find something like half a score of differences between them—differences, we must say, which are, as a rule, to the credit of the later investigators; though such points as the omission of the page in the case of Gould, Desor, and Sars are comparatively trivial, Messrs. Duncan and Sladen's list has a greater comparative value from giving the information*, while more serious omissions on the

* Or, in the case of Fabricius, giving it more correctly.

part of Prof. Alex. Agassiz are to be found in the absence of any reference to the work of Gmelin, or to the important notice of Brandt (Midd. Sib. Reise, ii. p. 34), in which there occur the very striking words—"Sondern auch mit den von Mertens mitgebrachten Individuen eines Seeigels, worauf der *Echinus chlorocentrotus* des Prodromus basirt ist, der also künftig als Synonym des *neglectus* zu citiren sein würde;" and which it is of interest to pit against the very opposite conclusion of Stimpson (a reference to whose 'Invertebrates of Grand Manan' is likewise omitted by Prof. Agassiz from his "synonymy")—"Among these are found several varieties, perhaps species, which an extended observation only can elucidate." Nor do Messrs. Duncan and Sladen follow the American writer in omitting a notice of Forbes's reference to the species in the Appendix to 'Sutherland's Journey,' where that gifted naturalist remarks on the fact that it is found in Pleistocene beds "associated with a molluscous fauna in many respects comparable with that of the Arctic seas."

We could carry this criticism further, but we gladly refrain: the lesson that it teaches us is not, however, a very satisfactory one; and if these things be done in the green tree, what shall be done in the dry*?

If a naturalist of first-class eminence afford material for such criticism, we may justly refuse to take on trust the work of those whose investigations have not attained, whether rightly or wrongly, the same vogue; but we feel bound to point out that, for the species under discussion, the only points open to criticism in Messrs. Duncan and Sladen's synonymy are those which we have thrown into the subjoined footnote. On the other hand, we cannot but regret that the present authors have thought it right to follow Müller and Troschel in the use of the term *Asteracanthion*, against the use of which Mr. Norman has already spoken in our pages, and that they have followed M. Perrier in returning to the quasi-specific names of Linck, whose work we are by no means behind the authors in regarding with the deepest respect. By speaking of *Astropecten corniculatus* Linck would indeed seem to be using the binominal method; but it is to be noted that his very next form is spoken of as *A. echinatus major*; and M. Perrier, by reviving the former of these terms, finds himself in opposition to every careful nomenclator since the time of Düben and Koren, who, in 1844, taught us to know this common form by Retzius's specific appellation of *crispatus*—a term we would, with deference, ask to be allowed to retain.

We greatly regret that we have been led to devote so much of our space to the mere question of nomenclature, and most sincerely wish it might have been otherwise. We have heard of men silenced by a "magni nominis umbra;" zoologists will have to be careful

* May we point out to Messrs. Duncan and Sladen that 1840, not 1841, is the date of Gould's 'Invertebrates of Massachusetts' (1st ed.), that the 'Forhandlinger' in which Sars describes *T. pallidus* bears the *date* of 1872, and that the full account of Prof. Lovén's invaluable 'Etudes' might well be referred to?

lest, under the chilling shade of synonymy, they lose the power which they need in all its fulness to help them solve the more important problems which, from the sides of embryology, anatomy, and palæontology, are receiving, if not their solution, yet their due attention.

The influences of "environment" are carefully noted by our authors, who are led to think that, in some cases at any rate, "the exigencies of arctic existence have acted in retarding the progress of growth-characters and in the maintenance of the youthful or more simple form." Again, they direct attention to the variations which they have observed in the length of the spinelets of the paxillæ of *C. pappósus*, pointing out that extreme shortness is probably the result of abrasion, and consequently depends on the nature of the locality. "Thus a starfish inhabiting the comparative calms of deep water would be subject to much less friction than one frequenting a littoral district or amongst pebbly shingle."

From the point of view of the zoological student we desire, if we may be allowed, to congratulate the authors on the conclusion of a work which will be to them a source of pardonable pride, and ourselves on a monograph which sufficiently proves that there are in England two naturalists, at any rate, to whom a valuable collection of Echinodermata may very safely be intrusted for description.

MISCELLANEOUS.

Discovery of a Fossil Bird in the Jurassic of Wyoming.

By O. C. Marsh.

The oldest birds hitherto known from American strata are the toothed forms (*Odontornithes*), from the Middle Cretaceous deposits on the eastern flanks of the Rocky Mountains. In Europe, three specimens of the genus *Archæopteryx* have been found in the Jurassic, but from other formations no remains of this class have been brought to light. The writer has made a careful search for fossil birds in the Jurassic beds of the West, and has been rewarded by the discovery of various remains, some of which are sufficiently characteristic for determination. The most important of these specimens is described below.

Laopteryx priscus, gen. et sp. nov.

The type specimen of the present species is the posterior portion of the skull, which indicates a bird rather larger than a blue heron (*Ardea herodias*). The brain-case is so broken that its inner surface is disclosed; and in other respects the skull is distorted; but it shows characteristic features. The bones of the skull are pneumatic. The occipital condyle is sessile, hemispherical in form, flattened, and slightly grooved above. There is no trace of a posterior groove. The foramen magnum is nearly circular, and small in pro-